Mathematics, Physics, or Business Education(with AP Computer Science teaching experience.

(4) **Gateway to Technology.** Required Certifications: Appropriate math and/or science meeting State Department of Education's grade level requirements, Technology Engineering or Trade and Industrial Education. Teachers teaching at the middle or high school level must hold the appropriate certification to instruct the specific grades being taught. Check State Department of Education current requirements.

(5) **Pre-Engineering.** Required Certifications: Chemistry, Physics, Advanced Mathematics, or Trade & Industrial.

(6) **Technology Engineering Middle School.** Appropriate math and/or science meeting State Department of Education's grade level requirements, Technology Engineering or Trade and Industrial Education. Teachers teaching at the middle or high school level must hold the appropriate certification to instruct the specific grades being taught. Check State Department of Education current requirements.

(7) **Technology Engineering High School.** Required Certifications: Technology Engineering,or Trade and Industrial.

(8) **Tech Connect.** Required Certifications: Trade & Industrial with NoCTI certification specific to area being taught.

(9) Teachers teaching math and/or science academic courses must meet the requirements of the Oklahoma State Department of Education for that specific academic course/area.

(e) **Professional development.** New instructors shall participate in pre-service professional development activities as required by the appropriate divisions. All secondary and full-time adult *Career*Tech instructors and staff shall participate in professional in-service as required by the appropriate divisions, including summer conference and mid-year activities.

780:20-3-5. Career and Technology Student Organizations

(a) **Student organizations as an integral part of the CareerTech program.** The Oklahoma Department of Career and Technology Education is the responsible entity for governance and administration of the career and technology student organizations and therefore has the authority to develop and enforce policy of the student organizations consistent with CareerTech program design and operation. Each secondary CareerTech program shall have an active and appropriate student organization as an integral part of its program.

(b) **Membership in appropriate organization.** Each student who participates in student organization activities shall be a member of the student organization designed for the occupational program in which the student is enrolled.

(c) **Organizations.** Career and technology student organizations shall include:

(1) DECA~~/Delta Epsilon Chi~~ (Business, Marketing and Information Technology Education)

(2) BPA (Business, Marketing and Information Technology Education), Business Professionals of America.

(3) FFA (Agricultural Education)

(4) FCCLA (Family and Consumer Sciences Education), Family, Career and Community Leaders of America

(5) HOSA (Health Careers Education and STEM)

(6) TSA (~~Technology Engineering and~~ STEM), Technology Students Association

(7) SkillsUSA (Trade and Industrial Education and STEM)

(d) **Accountability; loss of program funding.**

(1) The school and the career and technology student organization chapter will be held accountable for the actions of the student organization members and the advisor participating in any career and technology student organization activity. Failure to comply with the official rules of such activities may, after an opportunity to present reasons why said action should not occur, result in the loss of the state funding for that CareerTech program.

(2) The school and the FFA chapter will be held accountable for the actions of the FFA members and the FFA advisor participating in any FFA activity. Any Agricultural Education program that has a student/FFA member who is the owner of an animal testing positive for illegal or improper drugs or additives, has altered the appearance of the animal(s) surgically (other than normal and customary practice), and/or violates the eligibility rules for ownership of animals shall, after hearing, and after consideration by the State Board, and upon determination that there has been a violation of this policy, lose state funding for that program.

(e) **FFA Membership Eligibility.** Any student in Grades 8-12 must be regularly enrolled in a year long course of study in Agricultural Education at school in order to be eligible to participate in any FFA activity. For the purpose of this section; at school is defined as physically present and supervised in a classroom by a certified agricultural education instructor. Exceptions are granted to students who attend a school with block schedule and who, therefore, may have completed a year-long course of study in Agricultural Education in one semester. Students in the seventh grade are not eligible for the FFA membership in Oklahoma. Annual local, state, and national FFA dues must also be paid in order to be eligible to participate in any FFA activity.

[OAR Docket #15-598; filed 6-18-15]

TITLE 785. OKLAHOMA WATER RESOURCES BOARD
CHAPTER 45. OKLAHOMA'S WATER QUALITY STANDARDS

[OAR Docket #15-670]

RULEMAKING ACTION:
PERMANENT final adoption
RULES:
Subchapter 5. Surface Water Quality Standards

Part 3. Beneficial Uses and Criteria to Protect Uses
785:45-5-12. Fish and wildlife propagation [AMENDED]
Appendix E. Requirements for Development of Site-Specific Criteria for Certain Parameters [REVOKED]
Appendix E. Requirements for Development of Site-Specific Criteria for Certain Parameters [NEW]
Appendix G. Numerical Criteria to Protect Beneficial Uses [REVOKED]
Appendix G. Numerical Criteria to Protect Beneficial Uses [NEW]

AUTHORITY:
Oklahoma Water Resources Board, 82 O.S. §§ 1085.30 and 1085.30a; 27A O.S. § 1-3-101; and 82 O.S. § 1085.2.

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APPROVED BY GOVERNOR'S DECLARATION:
Approved by Governor's declaration on June 8, 2015

FINAL ADOPTION:
June 8, 2015

EFFECTIVE:
September 11, 2015

SUPERSEDED EMERGENCY ACTIONS:
n/a

INCORPORATIONS BY REFERENCE:
n/a

ANALYSIS:
The amendments to OAC 785:45-5-12 include: (a) striking the use support assessment language found in OAC 785:45-5-12(f)(1)(D); and (b) modifying OAC 785:45-5-12(f)(1)(C) to include (i) and (ii) which will now contain the provisions that relate to acute dissolved oxygen events. Table 1 of Appendix G is revoked and reenacted to include two additional footnotes clarifying how the 10% exceedance frequency is to be used and specifying where the WWAC dissolved oxygen criteria apply in lakes.

Appendix E, Requirements For Development of Site-Specific Criteria For Certain Parameters, is revoked and reenacted with the addition of a site specific Water Effect Ratio and Dissolved Translator standards for use in calculating permit limits for copper and zinc for the Broken Bow Public Works Authority's OPDES permit related to discharge of municipal and industrial wastewater to a tributary of Yanubbe Creek.

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PURSUANT TO THE ACTIONS DESCRIBED HEREIN, THE FOLLOWING RULES ARE CONSIDERED FINALLY ADOPTED AS SET FORTH IN 75 O.S., SECTIONS 250.3(5) AND 308(E), WITH AN EFFECTIVE DATE OF SEPTEMBER 11, 2015:

SUBCHAPTER 5. SURFACE WATER QUALITY STANDARDS

PART 3. BENEFICIAL USES AND CRITERIA TO PROTECT USES

785:45-5-12. Fish and wildlife propagation

(a) **List of subcategories.** The narrative and numerical criteria in this section are designed to maintain and protect the beneficial use classification of "Fish and Wildlife Propagation". This classification encompasses several subcategories which are capable of sustaining different climax communities of fish and shellfish. These subcategories are Habitat Limited Aquatic Community, Warm Water Aquatic Community, Cool Water Aquatic Community (Excluding Lake Waters), and Trout Fishery (Put and Take).

(b) **Habitat Limited Aquatic Community subcategory.**

(1) Habitat limited aquatic community means a subcategory of the beneficial use "Fish and Wildlife Propagation" where the water chemistry and habitat are not adequate to support a "Warm Water Aquatic Community" because:

(A) Naturally occurring water chemistry prevents the attainment of the use; or

(B) Naturally occurring ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of a sufficient volume of effluent to enable uses to be met; or

(C) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(D) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(E) Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of the "Warm Water Aquatic Community" beneficial use.

(2) Habitat Limited Aquatic Community may also be designated where controls more stringent than those required by sections 301(b) and 306 of the federal Clean Water Act as amended, which would be necessary to meet standards or criteria associated with the beneficial use subcategories of Cool Water Aquatic Community or Warm Water Aquatic Community, would result in substantial and widespread economic and social impact.

(c) **Warm Water Aquatic Community subcategory.** Warm Water Aquatic Community means a subcategory of the beneficial use category "Fish and Wildlife Propagation" where the water quality and habitat are adequate to support climax fish communities.

(d) **Cool Water Aquatic Community subcategory.** Cool Water Aquatic Community means a subcategory of the beneficial use category "Fish and Wildlife Propagation" where the water quality, water temperature and habitat are adequate to support cool water climax fish communities and includes an environment suitable for the full range of cool water benthos. Typical species may include smallmouth bass, certain darters and stoneflies.

(e) **Trout Fishery subcategory.** Trout Fishery (Put and Take) means a subcategory of the beneficial use category "Fish

and Wildlife Propagation" where the water quality, water temperature and habitat are adequate to support a seasonal put and take trout fishery. Typical species may include trout.

(f) **Criteria used in protection of fish and wildlife propagation.** The narrative and numerical criteria to maintain and protect the use of "Fish and Wildlife Propagation" and its subcategories shall include:

(1) **Dissolved oxygen.**

(A) Dissolved oxygen (DO) criteria are designed to protect the diverse aquatic communities of Oklahoma.

(B) Allowable loadings designed to attain these dissolved oxygen criteria are provided as follows:

(i) For streams with sufficient historical data, the allowable load shall be based on meeting the dissolved oxygen concentration standard at the seven-day, two-year low flow and the appropriate seasonal temperatures prescribed in Table 1 of Appendix G of this Chapter.

(ii) For streams lacking sufficient historical data, or when the appropriate flow is less than one (1) cubic foot per second (cfs), the allowable load shall be based on meeting the dissolved oxygen concentration standard at one (1) cfs and the appropriate seasonal temperature.

(iii) Provided, for streams designated in OAC 785:45 Appendix A as HLAC or WWAC which have sufficient historical data as determined by the permitting authority, the allowable BOD load may be based upon meeting the dissolved oxygen concentration standard at the applicable seasonal temperature and corresponding seasonal seven-day, two-year low flow.

(iv) Provided further, in stream segments where dams or other structures have substantially affected the historic flow regime of the stream segment, including but not limited to the portions of the Verdigris and Arkansas Rivers constituting the McClellan-Kerr Arkansas River Navigation System, a properly designed and implemented site-specific hydrologic study approved by the permitting authority and the Board may be used to determine the appropriate regulatory low flow. In such circumstances, the allowable BOD load may be based upon meeting the dissolved oxygen concentration standard at the applicable seasonal temperature and the site-specific regulatory low flow.

(C) Except for naturally occurring conditions ~~and as modified in (D) of this paragraph,~~ the dissolved oxygen criteria are as set forth in Table 1 of Appendix G of this Chapter. Additionally;

(i) For streams, no more than two DO samples shall exhibit a DO concentration of less than 2.0 mg/L in any given year.

(ii) For lakes, no more than 50% of the water volume shall exhibit a DO concentration less than 2.0 mg/L. If no volumetric data is available, then no more than 70% of the water column at any given sample site shall exhibit a DO concentration less than 2.0 mg/L. If a lake specific study including historical analysis demonstrates that a different percent volume or percent water column than described above is protective of the WWAC use, then that lake specific result takes precedence.

~~(D) For purposes of assessment, listing and reporting under sections 303(d) and 305(b) of the federal Clean Water Act as amended, the procedure for determining use support of the Fish and Wildlife Propagation beneficial use or any subcategory thereof with respect to dissolved oxygen shall be as follows:~~

~~(i) **General support test for all streams.** If more than two concentrations of DO in a stream are observed to be below 2.0 mg/L in any given year, the Fish and Wildlife Propagation beneficial use shall be deemed to be not supported.~~

~~(ii) **Support tests for HLAC streams.**~~

~~(I) The HLAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be fully supported with respect to the DO criterion if 10% or less of the samples from the stream are less than 4.0 mg/L from April 1 through June 15 and less than 3.0 mg/L during the remainder of the year.~~

~~(II) The HLAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be not supported with respect to the DO criterion if more than 10% of the samples from the stream are less than 4.0 mg/L from April 1 through June 15 or less than 3.0 mg/L during the remainder of the year due to other than naturally occurring conditions.~~

~~(iii) **Support tests for WWAC streams.**~~

~~(I) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be fully supported with respect to the DO criterion if 10% or less of the samples from the stream are less than 6.0 mg/L from April 1 through June 15 and less than 5.0 mg/L during the remainder of the year.~~

~~(II) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be undetermined with respect to the DO criterion if more than 10% of the samples from the stream are less than 6.0 mg/L and 10% or less of the samples are less than 5.0 mg/L from April 1 through June 15, or more than 10% of the samples are less than 5.0 mg/L and 10% or less of the samples are less than 4.0 mg/L from June 16 through October 15.~~

~~(III) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be not~~

supported with respect to the DO criterion if more than 10% of the samples from the stream are less than 5.0 mg/L from April 1 through June 15, or less than 4.0 mg/L from June 16 through October 15, or less than 5.0 mg/L from October 16 through March 31, due to other than naturally occurring conditions.

(iv) **Support tests for CWAC and Trout streams.**

(I) The CWAC or Trout subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be fully supported with respect to the DO criterion if 10% or less of the samples from the stream are less than 7.0 mg/L from March 1 through May 31 and less than 6.0 mg/L during the remainder of the year.

(II) The CWAC or Trout subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be undetermined with respect to the DO criterion if more than 10% of the samples from the stream are less than 7.0 mg/L and 10% or less of the samples are less than 6.0 mg/L from March 1 through May 31, or more than 10% of the samples are less than 6.0 mg/L and 10% or less of the samples are less than 5.0 mg/L from June 1 through October 15.

(III) The CWAC or Trout subcategory of the Fish and Wildlife Propagation beneficial use designated for a stream shall be deemed to be not supported with respect to the DO criterion if more than 10% of the samples from the stream are less than 6.0 mg/L from March 1 through May 31, or less than 5.0 mg/L from June 1 through October 15, or less than 6.0 mg/L from October 16 through the last day of February, due to other than naturally occurring conditions.

(v) **Support tests for WWAC lakes.** The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be fully supported with respect to the DO criterion if both the Surface and Water Column criteria prescribed in (vi)(I) and (vii)(I) of this subparagraph (D) are satisfied. If either of the Surface or Water Column criteria prescribed in (vi)(II) or (vii)(II) produce a result of undetermined, then the WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be undetermined with respect to the DO criterion; provided, if either of the Surface or Water Column criteria prescribed in (vi)(III) or (vii)(III) produce a result of not supported, then the WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be not supported with respect to the DO criterion.

(vi) **Surface criteria for WWAC lakes.**

(I) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be fully supported with respect to the DO criterion if 10% or less of the samples from the epilimnion during periods of thermal stratification, or the entire water column when no stratification is present, are less than 6.0 mg/L from April 1 through June 15 and less than 5.0 mg/L during the remainder of the year.

(II) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be undetermined with respect to the DO criterion if more than 10% of the samples from the epilimnion during periods of thermal stratification, or the entire water column when no stratification is present, are less than 5.0 mg/L and 10% or less of the samples are less than 4 mg/L from June 16 through October 15, or more than 10% of the samples from the surface are less than 6.0 mg/L and 10% or less of the samples are less than 5.0 mg/L from April 1 through June 15.

(III) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be not supported with respect to the DO criterion if more than 10% of the samples from the epilimnion during periods of thermal stratification, or the entire water column when no stratification is present, are less than 5.0 mg/L from April 1 through June 15 or less than 4.0 mg/L from June 16 through October 15, or less than 5.0 mg/L from October 16 through March 31, due to other than naturally occurring conditions.

(vii) **Water Column criteria for WWAC lakes.**

(I) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be fully supported during periods of thermal stratification with respect to the DO criterion if less than 50% of the volume (if volumetric data is available) or 50% or less of the water column (if no volumetric data is available) of all sample sites in the lake are less than 2.0 mg/L.

(II) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be undetermined during periods of thermal stratification with respect to the DO criterion if 50% or more, but not greater than 70%, of the water column at any given sample site in the lake is less than 2.0 mg/L due to other than naturally occurring conditions.

~~(III) The WWAC subcategory of the Fish and Wildlife Propagation beneficial use designated for a lake shall be deemed to be not supported during periods of thermal stratification with respect to the DO criterion if 50% or more of the water volume (if volumetric data is available) or more than 70% of the water column (if no volumetric data is available) at any given sample site is less than 2.0 mg/L.~~

~~(IV) If a lake specific study including historical analysis produces a support status which is contrary to an assessment obtained from the application of (I), (II) or (III) of (D)(vii) of this section, then that lake specific result will control.~~

~~(viii) **Additional application/exercise when support undetermined.** In instances where application of the tests in this subparagraph (D) initially produce a result that the pertinent subcategory is undetermined with respect to the DO criterion, such shall be subject to additional investigation that considers diurnal data for further application of such tests in order to resolve the determination of use support.~~

(2) **Temperature.**

(A) At no time shall heat be added to any surface water in excess of the amount that will raise the temperature of the receiving water more than 2.8°C outside the mixing zone.

(B) The normal daily and seasonal variations that were present before the addition of heat from other than natural sources shall be maintained.

(C) In streams, temperature determinations shall be made by averaging representative temperature measurements of the cross sectional area of the stream at the end of the mixing zone.

(D) In lakes, the temperature of the water column and/or epilimnion, if thermal stratification exists, shall not be raised more than 1.7°C above that which existed before the addition of heat of artificial origin, based upon the average of temperatures taken from the surface to the bottom of the lake, or surface to the bottom of the epilimnion if the lake is stratified.

(E) No heat of artificial origin shall be added that causes the receiving stream water temperature to exceed the maximums specified below:

(i) The critical temperature plus 2.8°C in warm water and habitat limited aquatic community streams and lakes except in the segment of the Arkansas River from Red Rock Creek to the headwaters of Keystone Reservoir where the maximum temperature shall not exceed 34.4°C.

(ii) 28.9°C in streams designated cool water aquatic community.

(iii) 20°C in streams designated trout fishery (put and take).

(F) Water in privately-owned reservoirs used in the process of cooling water for industrial purposes is exempt from these temperature restrictions, provided the water released from any such lake or reservoir into a stream system shall meet the water quality standards of the receiving stream.

(3) **pH (hydrogen ion activity).** The pH values shall be between 6.5 and 9.0 in waters designated for fish and wildlife propagation; unless pH values outside that range are due to natural conditions.

(4) **Oil and grease (petroleum and non-petroleum related).**

(A) All waters having the designated beneficial use of any subcategory of fish and wildlife propagation shall be maintained free of oil and grease to prevent a visible sheen of oil or globules of oil or grease on or in the water.

(B) Oil and grease shall not be present in quantities that adhere to stream banks and coat bottoms of water courses or which cause deleterious effects to the biota.

(5) **Biological Criteria.**

(A) Aquatic life in all waterbodies with the beneficial use designation of Fish and Wildlife Propagation (excluding waters designated "Trout, put-and-take") shall not exhibit degraded conditions as indicated by one or both of the following:

(i) comparative regional reference data from a station of reasonably similar watershed size or flow, habitat type and Fish and Wildlife beneficial use subcategory designation or

(ii) by comparison with historical data from the waterbody being evaluated.

(B) Compliance with the biological criteria to protect Fish and Wildlife Propagation set forth in this paragraph shall be based upon measures including, but not limited to, diversity, similarity, community structure, species tolerance, trophic structure, dominant species, indices of biotic integrity (IBI's), indices of well being (IWB's), or other measures.

(6) **Toxic substances (for protection of fish and wildlife).**

(A) Surface waters of the state shall not exhibit acute toxicity and shall not exhibit chronic toxicity outside the chronic regulatory mixing zone. Acute test failure and chronic test failure shall be used to determine discharger compliance with these narrative aquatic life toxics criteria. The narrative criterion specified in this subparagraph (A) which prohibits acute toxicity shall be maintained at all times and shall apply to all surface waters of the state. The narrative criterion specified in this subparagraph (A) which prohibits chronic toxicity shall apply at all times outside the chronic regulatory mixing zone and within the zone of passage to all waters of the state except:

(i) When a discharge into surface waters designated with the Fish and Wildlife Propagation beneficial use complies with and meets the discharge permit limitations but the flow immediately upstream from the discharge is less than one (1)

cubic foot per second or when the flow falls below the seven-day, two-year low-flow, whichever is larger. For purposes of the permitting process, the regulatory low flow shall be the larger of one (1) cubic foot per second or the seven-day, two-year low flow; and

(ii) To streams listed as ephemeral in Appendix A.

(B) Procedures to implement these narrative criteria are found in OAC 785:46 Subchapter 3.

(C) Toxicants for which there are specific numerical criteria are listed in Table 2 of Appendix G of this Chapter.

(D) For toxicants not specified in Table 2 of Appendix G of this Chapter, concentrations of toxic substances with bio-concentration factors of 5 or less shall not exceed 0.1 of published LC50 value(s) for sensitive representative species using standard testing methods, giving consideration to site specific water quality characteristics.

(E) Concentrations of toxic substances with bio-concentration factors greater than 5 shall not exceed 0.01 of published LC50 value(s) for sensitive representative species using standard testing methods, giving consideration to site specific water quality characteristics.

(F) Permit limits to prevent toxicity caused by discharge of chlorine and ammonia are determined pursuant to the narrative criteria contained within (A) and (B) of this paragraph.

(G) The acute and chronic numerical criteria listed in the "Fish and Wildlife Propagation" column in Table 2 of Appendix G of this Chapter apply to all waters of the state designed with any of the beneficial use sub-categories of Fish and Wildlife Propagation. The numerical criteria which prohibit acute toxicity apply outside the acute regulatory mixing zone.

(i) The numerical criteria specified in Table 2 of Appendix G which prohibit chronic toxicity shall apply at all times outside the chronic regulatory mixing zone and within the zone of passage to all waters of the state except:

(I) When a discharge into surface waters designated with the Fish and Wildlife Propagation beneficial use complies with and meets the discharge permit limitations but the flow immediately upstream from the discharge is less than one (1) cubic foot per second or when the flow falls below the seven-day, two-year low-flow, whichever is larger. For purposes of the permitting process, the regulatory low flow shall be the larger of one (1) cubic foot per second or the seven-day, two-year low flow; and

(II) To streams listed as ephemeral in Appendix A.

(ii) Equations are presented in Table 2 of Appendix G for those substances whose toxicity varies with water chemistry. Metals listed in Table 2 of Appendix G are measured as total metals in the water column.

(H) For purposes of assessment per OAC 785:46-15-5, criteria for dissolved metals identified in Table 3 of Appendix G of this Chapter may be ascertained and implemented as an alternative to the total recoverable metals criteria set forth in Table 2 of Appendix G. Such dissolved metals criteria may be determined by multiplying the total recoverable numerical criteria in OAC 785:45 Appendix G, Table 2 by the conversion factors identified in Table 3 of Appendix G.

(7) **Turbidity.**

(A) Turbidity from other than natural sources shall be restricted to not exceed the following numerical limits:

(i) Cool Water Aquatic Community/Trout Fisheries: 10 NTUs;

(ii) Lakes: 25 NTUs; and

(iii) Other surface waters: 50 NTUs.

(B) In waters where background turbidity exceeds these values, turbidity from point sources shall be restricted to not exceed ambient levels.

(C) Numerical criteria listed in (A) of this paragraph apply only to seasonal base flow conditions.

(D) Elevated turbidity levels may be expected during, and for several days after, a runoff event.

(8) **Sediments.** Concentrations or loads of suspended or bedded sediments that are caused by human activity shall not impair the Fish and Wildlife Propagation use or any subcategory thereof.

APPENDIX E. REQUIREMENTS FOR DEVELOPMENT OF SITE-SPECIFIC CRITERIA FOR CERTAIN PARAMETERS [REVOKED]

APPENDIX E. REQUIREMENTS FOR DEVELOPMENT OF SITE-SPECIFIC CRITERIA FOR CERTAIN PARAMETERS [NEW]

A. General applicability to metals

Numerical criteria for total recoverable metals to protect aquatic life are referenced in OAC 785:45-5-12(f)(6)(G) and Table 2 of Appendix G of this Chapter. For permitting purposes, such criteria for total recoverable Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, and Zinc may be translated into dissolved metals criteria using the conversion factors referenced in OAC 785:45-5-12(f)(6)(H) and Table 3 of Appendix G. Criteria for parameters other than metals are also located in Table 2 of Appendix G.

An additional alternative which may be utilized for permitting purposes is to determine site-specific criteria from either the total recoverable or the dissolved criteria. However, federal regulations found at 40 CFR 122.45(C) require that NPDES permit limits must express metals concentrations as total recoverable, not dissolved. Therefore, if dissolved criteria for metals are implemented, they must be translated to site-specific total metals criteria to be used in the issuance of permit limits consistent with OAC 785:46.

The permitting authority may issue a total recoverable permit limit if statewide total recoverable criteria are appropriate in the permitting authority's view, and/or satisfactory in the permittee's view. If permit limits obtained using total recoverable criteria are unsatisfactory to the permittee, the permittee may attempt to obtain different permit limits by developing site-specific criteria in accordance with the provisions of this Appendix.

Implementation of site-specific criteria may reduce the margin of safety afforded by implementation of criteria per 785:45-5-12(f)(6)(G) and Table 2 of Appendix G. Therefore, it is important that background concentration (which reduces the assimilation capacity of receiving water) be accounted for when site-specific criteria are implemented. Determination of background concentration requires a minimum of twelve samples collected over twelve months.

In order to develop permissible site-specific criteria, this Appendix must be followed to the satisfaction of the permitting authority and the OWRB. A work plan explaining sampling and analysis procedures and quality assurance/quality control must be approved by the OWRB prior to commencing the site-specific study. Upon completion, results must be submitted to OWRB and the permitting authority. Additional technical guidance is available in OWRB technical report 2001-2, "Guidance for Developing Site Specific Criteria for Metals and through Appendices J and L of the "Water Quality Standards Handbook", EPA publication no. 823-B-94-005a (August 1995). Permittees are strongly encouraged to evaluate both the discharge and receiving water using clean sampling techniques.

Upon OWRB approval, site-specific criteria shall be promulgated as part of this Appendix following the next subsequent permanent rulemaking to amend OAC 785:45. These site-specific

criteria supersede other numeric criteria promulgated elsewhere in this chapter if it is shown to the satisfaction of the Board that properties of the discharge or the circumstances surrounding the development of the site-specific criteria have not significantly changed since the promulgation of those site-specific criteria. Such criteria and the conditions around which they were derived, including but not limited to local environmental factors and effluent characteristics, shall be re-evaluated by the permit holder with each subsequent discharge permit renewal application or major modification request to determine if any significant changes have affected the propriety of the site-specific criteria.

B. Site-specific Criteria Applicability for NPDES Permit Activities

Oklahoma's site-specific criteria, except as otherwise specified, apply where the maximum concentration on the chronic regulatory mixing zone boundary occurs under critical conditions for receiving streams where $Q^*>0.1823$ and on the acute regulatory mixing zone boundary for streams where $Q^*\leq 0.1823$. Critical conditions include regulatory effluent and receiving stream flows. OAC 785:46-5-2(C) requires that effluent flow, Q_e, be the highest monthly averaged discharge if sufficient data is available, or the design flow otherwise. When chronic criteria implementation is appropriate, OAC 785:45-5-4 requires that the receiving stream flow, Q_u, be the larger of 7Q2 or 1 cfs. One cfs shall be used if the 7Q2 cannot be determined. The discharger shall be required to determine the 7Q2 per OAC 785:46-1-6 prior to the next permit cycle at which time the permit limits may be revised using the newly calculated Q_u (785:46-1-6(d)).

The maximum concentration on the mixing zone boundary may be simulated by mixing effluent and receiving water. Percent effluent in receiving water, PE, depends upon the dilution capacity of the stream and shall not exceed 100%. Dilution capacity, for streams, is represented as $Q^*= Q_e/Q_u$.

The following formulas shall be used to determine PE for receiving streams:

For streams with large dilution capacities ($Q^* <$ or equal to 0.1823), PE equals (194Q^*) divided by ($1 + Q^*$). PE for $Q^*<$ or equal to 0.1823 shall not be less than 10%.

For streams with intermediate dilution capacities ($0.1823 < Q^* < 0.3333$), PE equals (100) divided by ($6.17 - 15.51Q^*$).

For streams with small dilution capacities (Q^* > or equal to 0.3333), PE equals 100%.

Site-specific criteria in Oklahoma lakes are also based on the maximum concentration on the mixing zone boundary. The following formulas shall be used to determine PE for lakes:

PE equals 4.96D, D > or equal to 3 feet where D is pipe diameter.

PE equals $23.8\sqrt{W}$, W > or equal to 3 feet where W is canal width.

As with streams, PE is always less than or equal to 100% for lakes.

If PE is calculated to be less than 10%, then effluent water effect ratios shall use PE = 10%.

"Waterbody-specific" criteria, such as segment-specific metals, may not have limitations on its applicability. Rather, it may be used a substitute for other applicable statewide criteria for the entire waterbody.

Site-specific criteria are dependent, in part, on specific properties of the effluent that influence the bioavailability and toxicity of metals. Substantial changes in the quality or quantity of the effluent may affect the resulting site-specific criterion. Therefore, if the existing permit contains requirements for toxicity reduction evaluations (TREs) or pollution prevention efforts, a site-specific criterion should not be developed until after these efforts have been completed. A new site-specific criteria study would likely have to be performed after those requirements are met because the characteristics of the effluent may significantly change (e.g., hardness, pH, TDS). In cases where the quality or quantity of an effluent changes, the burden rests on the permittee to demonstrate that the effluent characteristics are not significantly altered to a degree that would affect the validity of the outcomes of the original site-specific criteria study. A site-specific criterion may need to be re-evaluated periodically to reflect changes in the system that may alter the characteristics of either the receiving water or effluent.

C. Site-specific Criteria Applicability for Activities Not Related to NPDES Permits

In certain circumstances, statewide numeric criteria for parameters other than metals may be replaced by segment-specific criteria for specific parameters applicable to just one waterbody. These criteria will be applicable to any point in the waterbody. These criteria must be shown to be protective of native aquatic life through procedures similar to those used in the WER procedures detailed here and in OWRB technical report 2001-2, "Guidance for Developing Site Specific Criteria for Metals".

Development of segment-specific criteria for minerals should follow the guidance contained in OWRB technical report TRWQ2001-2 ("Guidance For Developing Site-Specific Minerals Criteria"). Certain cases may require additional data or justification, but this document should provide sufficient basic guidance for the development of alternative criteria. Development of site-specific or segment-specific criteria for parameters for other than metals or minerals and lacking specific guidance documents will require extensive coordination with technical staff from OWRB and the permitting authority.

D. Sampling Procedures

General guidance for field sampling can be found in Appendix B of OWRB technical guidance document 2001-2, "Guidance for Developing Site Specific Criteria for Metals". The permittee shall collect both receiving water and effluent, and mix them together to obtain PE. Ambient water collections shall be representative of low stream flow events and collected at a location

unaffected by the discharge being permitted. Twenty-four (24) hour composite effluent samples representative of normal operation shall be collected at the outfall such that any periodic toxic discharges are captured and average effluent conditions are represented. Outfalls may be combined proportional to flow if in close proximity. Clean sampling techniques shall be used where possible and samples shall be analyzed by an Oklahoma certified laboratory utilizing generally accepted methods. Dilution water must be made in accordance with EPA's acute biomonitoring manual entitled "Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms", EPA publication no. 600/4-90-027 (1991). The pH, hardness, conductivity and alkalinity must be similar to that of the receiving water.

Site-specific criteria development for lakes should employ sampling procedures detailed in OWRB guidance document for B.U.M.P. Standard Operating Procedures. Deviation from these prescribed techniques must be justified to OWRB and the permitting authority prior to initiation of the sampling. Excursions from these techniques that occur as a result of on-site conditions must be reported to OWRB and the permitting authority as soon as possible. Implications of these deviations on the data quality and their appropriateness to the outcomes of the study must be reviewed and agreed upon by OWRB and the permitting authority prior to their use in the derivation of any criteria.

For systems lacking NPDES permitted dischargers, sampling procedures for determining background concentration detailed in the OWRB technical guidance 2001-2 shall be sufficient for characterizing local conditions.

E. Site-Specific Criteria Development Options for Metals:

Prior to the initiation of any work toward development of a site-specific criterion, interested parties must coordinate with OWRB technical staff. Such coordination will require, at a minimum, a workplan addressing project goals, collection and testing methods, quality assurance measures, and output schedules. This workplan will need to be reviewed and approved by OWRB and the permitting authority prior to initiation of any work.

Three options are available if the permittee decides to develop site-specific metals criteria for permitting purposes instead of utilizing the total recoverable criteria referenced in 785:45-5-12(f)(6)(G) and Table 2 of Appendix G.

1. Option 1: Water Effects Ratio (WER)

The permittee may obtain a site-specific water effects ratio (WER) to translate a state wide total criterion to a site-specific total criterion if the existing permit does not contain requirements for toxicity reduction evaluations or implementation of pollution prevention efforts. Toxicity tests using both laboratory dilution water and PE water must be performed. PE water is obtained by first determining the amount of water required for the toxicity test (e.g. 1L). Since $PE = 100V_e/(V_e + V_r)$, where V_e and V_r are volumes of effluent

and receiving water required for the toxicity test, respectively, then V_e = PE/100 (L). If PE = 25%, then V_e = 0.25L. Given that $V_e + V_r = 1$ (L) in this example, V_r = 1 - PE/100, or 0.75L.

Toxicity tests using two different species are required. Acute 48-hour static renewal definitive toxicity tests shall be performed by the permittee in accordance with the EPA guidance for acute testing identified above. LC_{50} tests shall be used to determine WER's for both acute and chronic criteria. Toxicity tests require adding metal to both PE and dilution water. It shall not be acceptable to estimate metal concentrations by measuring the amount added. Total recoverable concentrations must be used to obtain LC50's for both test species for PE and laboratory water in Option 1.

Multiple WER's must be performed. At a minimum, three tests in three different seasons must be performed for two test species. WER is computed as $LC_{50dilution}/LC_{50PE}$. A geometric mean of the WER's is the final water effect ratio, FWER. A minimum of four WER's must be used in the computation of FWER. An explanation of any WER's obtained but not used in computation of FWER must be provided to the permitting authority and OWRB. The total criterion specified in Table 2 of Appendix G is divided by FWER to obtain a site-specific total criterion. Background concentration must be determined to use with the site-specific criterion to develop permit limits.

2. Option 2: Dissolved To Total Fraction

Dissolved and total recoverable concentrations must be obtained to determine a dissolved to total fraction. Samples must be taken from the effluent, receiving water and PE water. The dissolved to total fraction must be successfully computed a minimum of ten times.

The dissolved to total fraction is defined as $f_i = C_{Di}/C_{Ti}$, where C_{Di} is the dissolved concentration in the ith PE sample, and C_{Ti} is the total recoverable concentration. The dissolved fraction for the site shall be determined as the geometric mean for the n samples.

$$\therefore f = \exp\left[\sum_{i=1}^{n} [\ln(f_i)]/n \right]$$

To develop a site-specific criterion from the dissolved fraction alone, divide the dissolved criterion determined from Table 3 of Appendix G by f. The result is a site-specific total recoverable criterion.

3. Option 3: Combining f And FWER

The most definitive method of developing a site-specific criterion is to modify a dissolved criterion to account for both the fraction of the concentration biologically available and the difference between the toxicity of the metal in the laboratory dilution water and in PE

water. In order to perform option 3, WER's must be obtained using dissolved concentrations. This accounts for differences between the toxicity of the dissolved metal in laboratory dilution water and dissolved metal in PE water.

A translator, T, is obtained as the product of f and dissolved FWER. T is divided into the dissolved criterion determined from Table 3 of Appendix G to obtain a site-specific total recoverable criterion.

F. Site-specific Criteria for Metals Which Have Been Developed for Particular Waterbodies

Subsequent to the initial promulgation of this Appendix, there have been cases in which interested persons have developed site-specific criteria for particular discharges or other circumstances in accordance with this Appendix. Such site-specific criteria are set forth below. These site-specific criteria shall be interpreted according to the following:

C_{ast} = acute statewide total criterion
C_{cst} = chronic statewide total criterion
C_{asd} = acute statewide dissolved criterion
C_{csd} = chronic statewide dissolved criterion
S_{ast} = acute site-specific total criterion
S_{cst} = chronic site-specific total criterion
$FWER_t$ = final total water effects ratio
$FWER_d$ = final dissolved water effect ratio
f = dissolved to total fraction

Acute site-specific criteria are appropriate for large streams and chronic site-specific criteria are appropriate for small and medium size streams.

Options Allowed In Appendix E

Option 1
$S_{ast} = C_{ast}/FWER_t$
$S_{cst} = C_{cst}/FWER_t$

Option 2
$S_{ast} = C_{csd}/f$
$S_{cst} = C_{csd}/f$

Option 3
$S_{ast} = C_{csd}/(fxFWER_d)$
$S_{cst} = C_{csd}/(fxFWER_d)$

1. City of Blackwell Discharge to Chikaskia River

A site-specific criteria modification study has been satisfactorily completed for cadmium for the City of Blackwell.

$FWER_t = 0.0989$
$FWER_d = 0.2905$
$f = 0.18$

The results of the study allow any of the four following criteria to be utilized.

$C_{cst} = 2.2$ µg/L	Statewide criterion
$S_{cst} = 22.24$ µg/L	Option 1
$S_{cst} = 10.68$ µg/L	Option 2
$S_{cst} = 36.76$ µg/L	Option 3

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

2. AES Shady Point Discharge to Poteau River

A site-specific criteria modification study has been satisfactorily completed for copper for AES Shady Point.

$FWER_t = 0.0876$
$FWER_d = 0.1306$
$f = 0.5936$

The results of the study allow any of the four following criteria to be utilized.

$C_{cst} = 9.50$ µg/L	Statewide criterion
$S_{cst} = 65$ µg/L	Option 1
$S_{cst} = 15.3$ µg/L	Option 2
$S_{cst} = 74$ µg/L	Option 3

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

3. City of Idabel Discharge to Mud Creek

A. Lead

A site-specific criteria modification study has been satisfactorily completed for lead for the City of Idabel.

$FWER_t$ = 2.5912
$FWER_d$ = 0.2914
f = 0.7157

The results of the study allow any of the four following criteria to be utilized.

C_{cst} = 2.3492 µg/L	Statewide criterion
S_{cst} = 0.9066 µg/L	Option 1
S_{cst} = 2.7104 µg/L	Option 2
S_{cst} = 9.3036 µg/L	Option 3

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

B. Nickel

A site-specific criteria modification study has been satisfactorily completed for nickel for the City of Idabel.

$FWER_t$ = 1.1244
$FWER_d$ = 0.9735
f = 0.5798

The results of the study allow any of the four following criteria to be utilized.

C_{cst} = 128.8834 µg/L	Statewide criterion
S_{cst} = 114.6242 µg/L	Option 1
S_{cst} = 221.6226 µg/L	Option 2
S_{cst} = 227.6697 µg/L	Option 3

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

C. Zinc

A site-specific criteria modification study has been satisfactorily completed for zinc for the City of Idabel.

$FWER_t$ = 0.6714
$FWER_d$ = 0.7178
f = 0.6213

The results of the study allow any of the four following criteria to be utilized.

C_{cst} = 96.6161 µg/L	Statewide criterion
S_{cst} = 129.0082 µg/L	Option 1
S_{cst} = 137.4592 µg/L	Option 2
S_{cst} = 191.4874 µg/L	Option 3

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

4. Oklahoma Gas & Electric Mustang Generating Station Discharge to North Canadian River at NE 1/4 of NE 1/4 of SE 1/4 of Section 36, T 12 N, R 5 WIM, Canadian County, Oklahoma

A site-specific criteria modification study has been satisfactorily completed for copper for the Oklahoma Gas & Electric Mustang Generating Station discharge to the North Canadian River.

$FWER_t$ = 0.053
$FWER_d$ = 0.224
f = 0.368 (0.37)

The results of the study allow any of the four following criteria to be utilized. All criteria are calculated at an in-stream hardness of 334 mg/L.

C_{cst} = 35.9 µg/L	Statewide criterion
S_{cst} = 677 µg/L	Option 1
S_{cst} = 94.0 µg/L	Option 2
S_{cst} = 416.0 µg/L	Option 3 (Recommended in OG&E study)

C_{ast} = 59.8 µg/L	Statewide criterion
S_{ast} = 1128 µg/L	Option 1
S_{ast} = 156.0 µg/L	Option 2
S_{ast} = 692.0 µg/L	Option 3 (Recommended in OG&E study)

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

5. City of Poteau Discharge to Poteau River at SE 1/4 of NW 1/4 of Section 30, T 7 N, R 26 EIM, LeFlore County, Oklahoma

A. Copper

A site-specific criteria modification study has been satisfactorily completed for copper for the City of Poteau discharge to the Poteau River.

$FWER_t$ = 0.1850
$FWER_d$ = 0.1765
f = 0.2969

The results of the study allow any of the four following criteria to be utilized. All criteria are calculated at an in-stream hardness of 25.75 mg/L.

C_{cst} = 4.02 µg/L	Statewide criterion
S_{cst} = 21.73 µg/L	Option 1
S_{cst} = 13.0 µg/L	Option 2
S_{cst} = 73.66 µg/L	Option 3 (Recommended in Poteau study)

C_{ast} = 5.35 µg/L	Statewide criterion
S_{ast} = 28.92 µg/L	Option 1
S_{ast} = 17.31 µg/L	Option 2
S_{ast} = 98.09 µg/L	Option 3 (Recommended in Poteau study)

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

B. Zinc

A site-specific criteria modification study has been satisfactorily completed for zinc for the City of Poteau discharge to the Poteau River.

$FWER_t$ = 0.4040
$FWER_d$ = 0.4276

The results of the study allow any of the four following criteria to be utilized. All criteria are calculated at an in-stream hardness of 25.75 mg/L. However, option 1 was deemed sufficient to provide relief from a zinc limit in the discharge permit.

C_{cst} = 33.59 µg/L	Statewide criterion
S_{cst} = 83.14 µg/L	Option 1 (Recommended in Poteau study)

C_{ast} = 37.08 µg/L	Statewide criterion
S_{ast} = 91.78 µg/L	Option 1 (Recommended in Poteau study)

C. Cadmium

A site-specific criteria modification study has been satisfactorily completed for cadmium for the City of Poteau discharge to the Poteau River.

$FWER_t = 0.2427$
$FWER_d = 0.2400$

The results of the study allow any of the following criteria to be utilized. All criteria are calculated at an in-stream hardness of 25.75 mg/L.

C_{cst} = 0.39 µg/L	Statewide criterion
S_{cst} = 1.61 µg/L	Option 1
S_{cst} = 0.38 µg/L	Option 2
S_{cst} = 1.58 µg/L	Option 3 (Recommended in Poteau study)

C_{ast} = 7.30 µg/L	Statewide criterion
S_{ast} = 30.08 µg/L	Option 1
S_{ast} = 7.31 µg/L	Option 2
S_{ast} = 30.46 µg/L	Option 3 (Recommended in Poteau study)

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

D. Silver

A site-specific criteria modification study has been satisfactorily completed for silver for the City of Poteau discharge to the Poteau River.

$FWER_t = 0.2075$
$FWER_d = 0.2908$

The results of the study allow any of the following criteria to be utilized. All criteria are calculated at an in-stream hardness of 25.75 mg/L.

Statewide chronic criteria are available for this parameter.

C_{ast} = 0.39 µg/L	Statewide criterion
S_{ast} = 1.88 µg/L	Option 1
S_{ast} = 0.94 µg/L	Option 2
S_{ast} = 3.24 µg/L	Option 3 (Recommended in Poteau study)

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

E. Lead

A site-specific criteria modification study has been satisfactorily completed for lead for the City of Poteau discharge to the Poteau River.

$FWER_t = 0.1782$
$FWER_d = 0.1828$

The results of the study allow any of the following criteria to be utilized. All criteria are calculated at an in-stream hardness of 25.75 mg/L.

C_{cst} = 0.57 µg/L	Statewide criterion
S_{cst} = 3.20 µg/L	Option 1
S_{cst} = 0.59 µg/L	Option 2
S_{cst} = 3.25 µg/L	Option 3 (Recommended in Poteau study)

C_{ast} = 14.52 µg/L	Statewide criterion
S_{ast} = 81.48 µg/L	Option 1
S_{ast} = 15.15 µg/L	Option 2
S_{ast} = 82.88 µg/L	Option 3 (Recommended in Poteau study)

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

6. City of Heavener Discharge to Morris Creek at SE 1/4 of NW 1/4 of Section 30, T 7 N, R 26 EIM, LeFlore County, Oklahoma: Copper

A site-specific criteria modification study has been satisfactorily completed for copper for the City of Heavener discharge to Morris Creek.

$FWER_t = 0.1294$
$FWER_d = 0.1216$
$f = 0.8595$

The results of the study allow any of the four following criteria to be utilized. All criteria are calculated at an in-stream hardness of 25.75 mg/L.

C_{cst} = 4.02 µg/L	Statewide criterion
S_{cst} = 31.07 µg/L	Option 1
S_{cst} = 4.68 µg/L	Option 2
S_{cst} = 38.50 µg/L	Option 3 (Recommended in Morris Ck. study)

C_{ast} = 5.35 µg/L	Statewide criterion
S_{ast} = 41.34 µg/L	Option 1
S_{ast} = 6.22 µg/L	Option 2
S_{ast} = 51.19 µg/L	Option 3 (Recommended in Morris Ck. study)

The discharger may choose the above criterion it wishes to use for discharge permit calculations.

7. City of Broken Bow to Unnamed Tributary of Yanubbe Creek at SE 1/4 of SE 1/4 of SE 1/4 of Section 18, T 6 S, R 24 EIM, McCurtain County, Oklahoma (Latitude 34° 01' 37.165" North, Longitude 94° 43' 22.270" West)

A. Copper

A site-specific criteria modification study has been satisfactorily completed for copper for the City of Broken Bow Public Works Authority discharge to Unnamed Tributary of Yanubbe Creek. All criteria are calculated at an in-stream hardness of 34.9 mg/L.

$FWER_t$ = 0.0995
$FWER_d$ = 0.1253
f = 0.6544

The results of the study allow any of the four following criteria to be utilized

C_{cst} = 5.20 µg/L	Statewide criterion
S_{cst} = 52.28 µg/L	Option 1
S_{cst} = 7.628 µg/L	Option 2
S_{cst} = 60.87 µg/L	Option 3

C_{ast} = 7.12 µg/L	Statewide criterion
S_{ast} = 71.58 µg/L	Option 1
S_{ast} = 10.45 µg/L	Option 2
S_{ast} = 83.34 µg/L	Option 3

B. Zinc

A site-specific criteria modification study has been satisfactorily completed for zinc for the City of Broken Bow Public Works Authority discharge to Unnamed Tributary of Yanubbe Creek. All criteria are calculated at an in-stream hardness of 34.9 mg/L.

$FWER_t$ = 0.6312
$FWER_d$ = 0.7502
f = 0.7343

C_{cst} = 43.44 µg/L Statewide criterion
S_{cst} = 68.82 µg/L Option 1
S_{cst} = 58.33 µg/L Option 2
S_{cst} = 77.75 µg/L Option 3

C_{ast} = 47.96 µg/L Statewide criterion
S_{ast} = 75.99 µg/L Option 1
S_{ast} = 63.88 µg/L Option 2
S_{ast} = 85.15 µg/L Option 3

G. Site-Specific Criteria for Parameters Other Than Metals

The purpose of site-specific criteria investigations may not necessarily be intended to prevent toxicity as a result of the substance of concern. Various substances may produce various types of adverse impacts in the environment. For example, minerals may produce a toxic response due to ionic imbalance while nutrients may produce various impacts depending upon algal response to various conditions within the system. Examples of such systems include those where there may be nitrogen, phosphorus or light limitations. Resulting site-specific criteria may involve seasonal, spatial or other limitations as well as specific numeric limitations.

"Waterbody-specific" criteria, such as certain nutrients in Sensitive Water Supplies or segment-specific metals, may not have limitations on its applicability. Rather, it may be used a substitute for other applicable statewide criteria.

Development of site-specific criteria for minerals should follow the guidance contained in OWRB technical report TRWQ2001-2 ("Guidance For Developing Site-Specific Minerals Criteria"). Certain cases may require additional data or justification, but this document should provide sufficient basic guidance for the development of site-specific criteria.

Development of site-specific criteria for parameters other than metals or minerals and lacking specific guidance documents will require extensive coordination with technical staff from OWRB and the permitting authority. Such coordination will require, at a minimum, a workplan addressing project goals, collection and testing methods, quality assurance measures and output schedules. This workplan will need to be reviewed and approved by OWRB and the permitting authority prior to initiation of any work.

Those instances in which site-specific phosphorus or nitrogen criteria may be promulgated pursuant to OAC 785:45-5-10(7) titled "Chlorophyll-a numerical criterion for certain waters" will be limited to those waterbodies that have been shown to be impaired by nutrients and a numeric nutrient criterion has been determined to be the best way to affect reductions in the target nutrient. Such a demonstration will follow procedures outlined in OAC 785:46-15-10. Criteria may be derived from the result of "Clean Lake Studies" or other site-specific investigations performed by an agency of competent authority or a designee.

In cases where toxicity may be a concern due to the parameter in question, toxicity testing using two different species is required. Such testing should comply with the procedures detailed in OAC 252:690 and guidance found in OWRB technical report TRWQ2002-1 *(Guidance Document for the Development of Site-Specific Water Quality Criteria for Metals*). Exceptions to or deviations from these protocols should be brought to the attention of the OWRB and permitting authority prior to completion of the testing and thoroughly detailed in the final report.

H. Site-specific Criteria for Nutrients Which Have Been Developed for Particular Waterbodies
(reserved)

I. Site-specific Criteria for Other Parameters Which Have Been Developed for Particular Waterbodies

1. American Electric Power discharge to a tributary of Nine Mile Creek and Nine Mile Creek upstream of the confluence with East Cache Creek at Section 4, T 1 S, R 11 WIM, Comanche County.

   A site-specific mineral study has been satisfactorily completed on these waterbodies indicating that the actual agricultural uses of the waterbody are capable of tolerating more mineral input than currently allowed by the default values in Appendix F for segment 311300. The following criteria are allowed for the protection of the actual agricultural usage of the water.

	Total Dissolved Solids	Sulfate	Chloride
Yearly mean standard (mg/L)	1680	338	499
Sample standard (mg/L)	2100	423	624

APPENDIX G. NUMERICAL CRITERIA TO PROTECT BENEFICIAL USES [REVOKED]

APPENDIX G. NUMERICAL CRITERIA TO PROTECT BENEFICIAL USES [NEW]

(a) **Introduction.** This Appendix prescribes numerical limits for certain criteria which are necessary to protect beneficial uses as and wherever designated. Table 1 is a chart that states the numerical limits to protect the beneficial use and subcategories of Fish and Wildlife Propagation for the single parameter of dissolved oxygen as set forth in OAC 785:45-5-12(f)(1). The latter limits vary depending upon several factors including the pertinent subcategory or fishery class, the time of the year, and the seasonal temperature. Table 2 prescribes the numerical limits for certain substances or parameters in order to protect beneficial uses and subcategories as set forth in OAC 785:45-5-10(1), 785:45-5-10(6), 785:45-5-12(f)(6), and 785:45-5-20. The numerical limits may vary from one beneficial use or subcategory to another according to how the criteria are required by OAC 785:45 or OAC 785:46 to be implemented. Table 3 is a chart that sets forth conversion factors that can be used to determine criteria for dissolved metals in order to protect the beneficial use of Fish and Wildlife Propagation and all its subcategories as set forth in OAC 785:45-5-12(f)(6)(H).

(b) **Explanations for abbreviations and certain terms in Tables.**

(1) "CAS #" refers to a parameter's Chemical Abstract Service registry number. Each of these numbers is a unique identifier of a particular compound with a particular structure; the number provides additional and further specificity for the parameter in question than simply identifying it by a systematic, generic, proprietary, or [trivial] name. The CAS number has no particular chemical significance.

(2) Equations are prescribed for those substances the toxicity of which varies with water chemistry.

(3) Metals that are listed in Tables 2 and 3 shall be measured as total metals in the water column.

TABLE 1.

Dissolved Oxygen Criteria to Protect Fish and Wildlife Propagation and All Subcategories Thereof [1]

SUBCATEGORY OF FISH AND WILDLIFE PROPAGATION (FISHERY CLASS)	DATES APPLICABLE	D.O. CRITERIA [4] (MINIMUM) (mg/L)	SEASONAL TEMPERATURE (°C)
Habitat Limited Aquatic Community			
Early Life Stages	4/1 - 6/15	4.0	25[3]
Other Life Stages			
Summer Conditions	6/16 - 10/15	3.0	32
Winter Conditions	10/16 - 3/31	3.0	18
Warm Water Aquatic Community [5]			
Early Life Stages	4/1 - 6/15	6.0[2]	25[3]
Other Life Stages			
Summer Conditions	6/16 - 10/15	5.0[2]	32
Winter Conditions	10/16 - 3/31	5.0	18
Cool Water Aquatic Community & Trout			
Early Life Stages	3/1 - 5/31	7.0[2]	22
Other Life Stages			
Summer Conditions	6/1 - 10/15	6.0[2]	29
Winter Conditions	10/16 - 2/28	6.0	18

[1] For use in calculation of the allowable load.

[2] Because of natural diurnal dissolved oxygen fluctuation, a 1.0 mg/l dissolved oxygen concentration deficit shall be allowed for not more than eight (8) hours during any twenty-four (24) hour period.

[3] Discharge limits necessary to meet summer conditions will apply from June 1 of each year. However, where discharge limits based on Early Life Stage (spring) conditions are more restrictive, those limits may be extended to July 1.

[4] DO shall not exhibit concentrations less than the criteria magnitudes expressed above in greater than 10% of the samples as assessed across all life stages and seasons.

[5] For Lakes, the warm water aquatic community dissolved oxygen criteria expressed above are applicable to the surface waters.

TABLE 2.
Numerical Criteria to Protect Beneficial Uses and All Subcategories Thereof

PARAMETER	CAS #	Fish & Wildlife Propagation		Public & Private Water Supply (Raw Water)	Fish Consumption (+ Other Organisms) and Water	Fish Consumption (+ Other Organisms)
		ACUTE	CHRONIC			
		µg/L	µg/L	µg/L	µg/L	µg/L
INORGANICS						
Arsenic	7440382	360.0	190	40		205.0
Barium	7440393			1000		
Cadmium	7440439	e(1.128[ln(hardness)] -1.6774)	e(0.7852[ln(hardness)] -3.490)	20	14.49	84.13
Cadmium for trout streams		e(1.128[ln(hardness)] -3.828)	e(0.7852[ln(hardness)] -3.490)	20	14.49	84.13
Chromium (total)			50	50	166.3	3365.0
Copper	7440508	e(0.9422[ln(hardness)] -1.3844)	e(0.8545[ln(hardness)] -1.386)	1000		
Cyanide	57125	45.93	10.72	200		
Fluoride @ 90° F				4000		
Lead	7439921	e(1.273[ln(hardness)] -1.460)	e(1.273[ln(hardness)] -4.705)	100	5.0	25.0
Mercury	7439976	2.4	1.302	2	0.050	0.051
Nickel	7440020	e(0.8460[ln(hardness)] +3.3612)	e(0.846[ln(hardness)] +1.1645)		607.2	4583.0
Nitrates (as N)	14797558			10,000		
Selenium	7782492	20.0	5	10		
Silver	7440224	e(1.72[ln(hardness)] -6.52)		50	104.8	64620.0
Thallium	7440280	1400.0			0.24	0.47
Zinc	7440666	e(0.8473[ln(hardness)] +0.8604)	e(0.8473[ln(hardness)] +0.7614	5000		

PARAMETER	CAS #	Fish & Wildlife Propagation		Public & Private Water Supply (Raw Water)	Fish Consumption (+ Other Organisms) and Water	Fish Consumption (+ Other Organisms)
		ACUTE	CHRONIC			
		µg/L	µg/L	µg/L	µg/L	µg/L
ORGANICS						
1-1-1 TCE	71556				3094.0	173100.0
2-4-5-TP Silvex	93721		10.0	10		
2-4-6-TNT		450.0				
2-4-D	94757			100		
Acrolein	107028				6.0	9.0
Acrylonitrile	107131	7550.0			0.51	2.5
Aldrin	309002	3.0			0.00049	0.00050
Benzene	71432		2200.0		22	510
Benzidine	92875			1		
Carbon Tetrachloride	56235				2.3	16
Chlordane	57749	2.4	0.17		0.0080	0.0081
Chloroform	67663				56.69	4708.0
Chlorpyrifos (Dursban)	2921882	0.083	0.041			
4,4'-DDD	72548				0.0031	0.0031
4,4'-DDT	50293	1.1	0.001		0.0022	0.0022
Demeton	8065483		0.1			
Detergents (total)				200		
Diazinon	333415	0.17				
Dichlorobromomethane	75274				5.5	170
Dieldrin	60571	2.5	0.0019		0.00052	0.00054
Dioxin (TCDD)	1746016				5.0E-08	5.1E-08
Endosulfan		0.22	0.056			
Endrin	72208	0.18	0.0023	0.2	0.059	0.060
Ethylbenzene	100414				530	2100
Guthion	86500		0.01			
gamma BHC (Lindane)	58899	2.0	0.08	4	0.98	1.8
Heptachlor	76448	0.52	0.0038		0.00079	0.00079

PARAMETER	CAS #	Fish & Wildlife Propagation		Public & Private Water Supply (Raw Water)	Fish Consumption (+ Other Organisms) and Water	Fish Consumption (+ Other Organisms)
		ACUTE	CHRONIC			
		µg/L	µg/L	µg/L	µg/L	µg/L
ORGANICS						
Hexachlorobenzene	118741				0.0028	0.0029
Malathion	121755		0.10			
Methoxychlor	72435		0.03	100		
Methylene blue active substances			0.001	500		
Mirex	2385855		0.001			
Nonylphenol	25154523	28	6.6			
Parathion	56382	0.065	0.013			
PCB			0.044		0.00064	0.00064
PCE (Tetrachloroethylene)	127184	5280.0			6.9	33
Pentachlorophenol	87865	e[1.005(pH)-4.830]	e[1.005(pH)-5.290]		2.7	30
Perchlorate	7601-90-3	6600	1800		9	
Phenol	108952				10,000.0	860,000.0
Phthalate esters				3		
Bis(2-ethylhexyl) phthalate (BEHP)	117817				12	22
Butylbenzyl phthalate	85687			150	1500	1900
Diethyl phthalate	84662				17000	44000
Dimethyl phthalate	131113				2.7E+05	1.1E+06
Di-*n*-Butyl phthalate	84742				2000	4500
RDX	121824	2591.5				
Toluene	108883		875.0		1300	15000
Toxaphene	8001352	0.78	0.0002	5		

TABLE 3

Conversion Factors for Total to Dissolved Fractions
[H=hardness as $CaCO_3$ (mg/L)]

METAL	CAS#	ACUTE	CHRONIC
Arsenic	7440382	1.000	1.000
Cadmium	7440439	1.136672 – 0.041838 lnH	1.101672 – 0.041838 lnH
Copper	7440508	0.960	0.960
Lead	7439921	1.46203 – 0.145712 lnH	1.46203 – 0.145712 lnH
Mercury	7439976	0.85	N/A
Nickel	7440020	0.998	0.997
Silver	7440224	0.85	N/A
Zinc	7440666	0.978	0.986

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